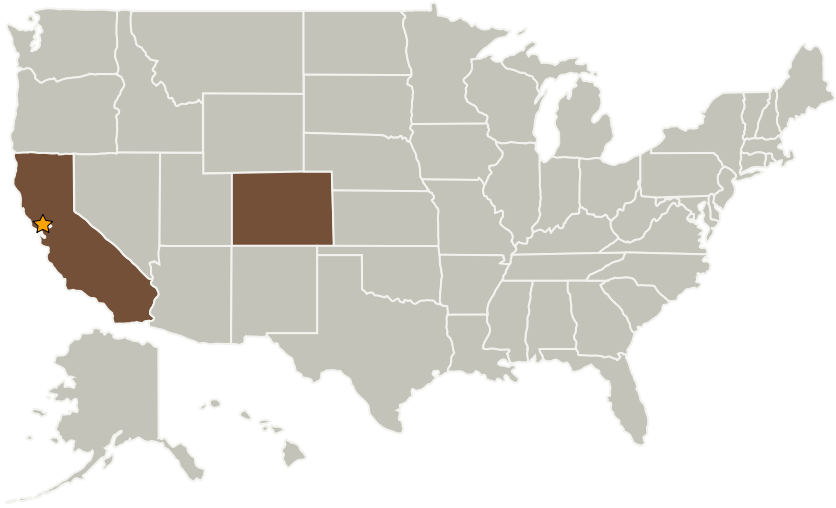
Nanostructured Catalytic Reactors for Air Purification, Phase I

Completed Technology Project (2007 - 2007)

Project Introduction

This SBIR Phase I project proposes the development of lightweight compact nanostructured catalytic reactors for air purification from toxic gaseous organic pollutants, particulate matter, and microorganisms. Volatile organic compounds will be catalytically oxidized when the contaminated air stream is passed through high-density arrays of uniform ultra-high aspect ratio, high surface area, cylindrical nanoreactors. Such unique architecture provides improved mass and heat transfer and ensures conversion of volatile organics into non-toxic products with unmatched efficiency. Room temperature oxidation of formaldehyde at low ppm level has already been confirmed. In addition, particulate matter, bacteria and fungi will be filtered out from the air stream at the reactor surface (nanopore diameter of the proposed reactors will not exceed 300 nm). The proposed low-mass, low-volume and low-power-consumption reactors are intended to replace and extend functionality of conventional packed-bed catalytic oxidizers used currently for removal of trace organic contaminants from spaceship atmospheres. The Phase I work will focus on fabricating the reactor prototypes and evaluating of their performance in catalytic oxidation of selected volatile organic compounds.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Synkera Technologies, Inc.	Supporting Organization	Industry	Longmont, Colorado

Primary U.S. Work Locations	
California	Colorado

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.4 Remediation